Lab 10: Internet Services

The goal of this lab is to configure a Linux system as a web server capable of hosting multiple web sites. You will do this by three different methods:

1. Multiple websites will be supported through user accounts on the system hosting the web service. These accounts will be accessible through Apache's support of home directories via the *servername/~username* construct.
2. A second approach involves virtual domains, so that our websites appear to be independent of each other. These virtual domains will be based on multiple IP addresses assigned to the web server, one per virtual domain.
3. The third method will use name-based virtual domains. Obviating the need for multiple IP addresses, this approach requires clients to support HTTP 1.1

Lab 10 - Internet Services
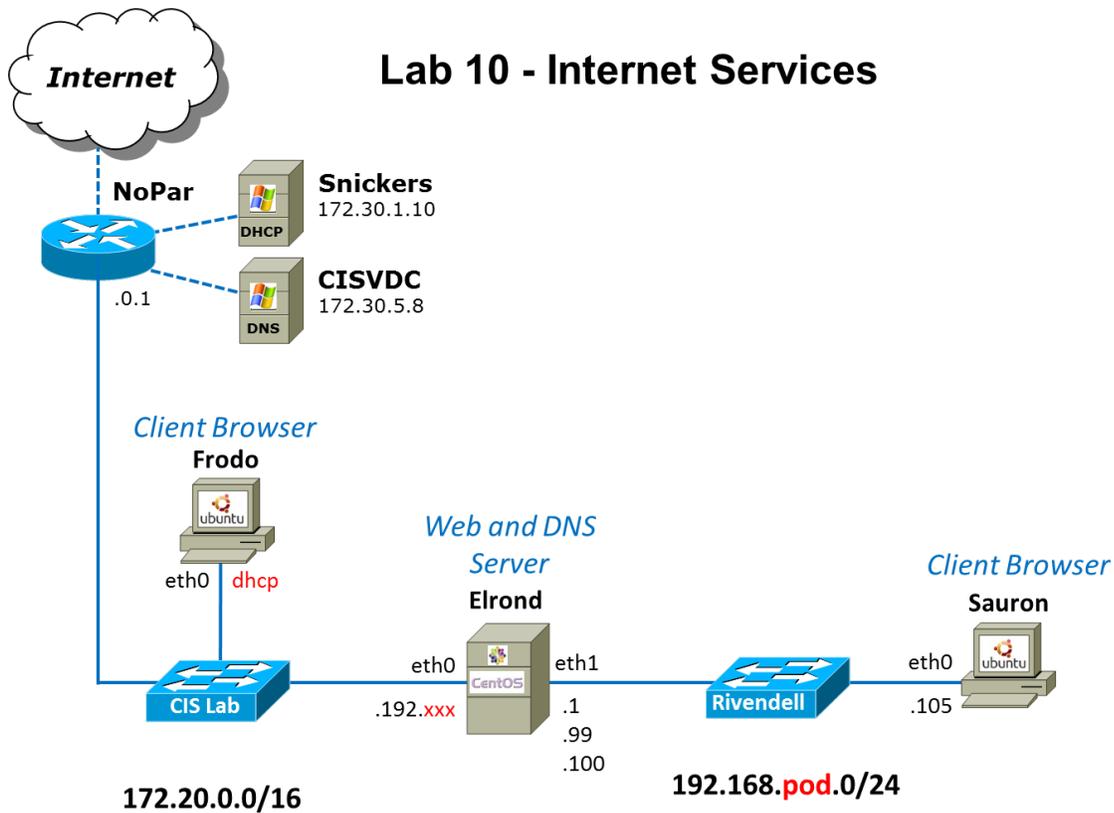
Supplies

- VMWare vSphere and ESXi server
- 192 VMs shown above

Preconfiguration

1. Revert to the Pristine snapshot on all VMs for a clean start
2. Read carefully the whole lab and make a custom network map and crib sheet of commands to use.
3. Make a copy of the lab10 text file in */home/cis192/depot* in your home directory on Opus.

Forum

Use the forum to ask and answer questions, collaborate, and report any equipment issues. Post tips and any lessons learned when you have finished. Forum is at: http://oslab.cabrillo.edu/forum/

Background

Virtual domain web hosting relies on DNS to provide address records and aliases for the host machine. Therefore you will have to set up DNS, as we did in a previous lab, to support methods two and three described above.

The services and programs we will be using for this lab are:

- *named (Bind)*
- *httpd (Apache)*
- *mozilla or firefox*

The installation of apache and configuring the home directories will require root access.

Setup

1. On Frodo, cable and configure dhcp. Add pxx-elrond to the */etc/hosts* file so you can ping Elrond by name when it's configured.
2. On Sauron, cable and configure as shown above. Configuring the static IP address, default gateway and name servers in */etc/network/interfaces*:
   auto eth0
   iface eth0 inet static
   address 192.168.pod.105
   netmask 255.255.255.0
   gateway 192.168.pod.1
   dns-search rivendell
   dns-nameservers 192.168.pod.1
   (and don't forget to restart the networking service when finished)
3. On Elrond, cable as shown above and:
   - Configure it to be a router by enabling forwarding.
   - Set the hostname to pxx.elrond.rivendell.
   - Allow forwarding in the firewall.
   - Provide NAT with masquerade to provide Rivendell hosts with internet access.

- Use permanent aliases to configure the additional IP addresses on the Elrond eth1 interface.

Part I - User Directory Websites

In this step, you will turn Elrond into a Linux Web server using Apache. Each user account will be enabled to publish files from their own *public_html* directory. The URL to access a user's site is http://*servername*/~*username*. This involves configuring the *httpd.conf* file, creating some users, adding web file content, setting file permissions and SELinux contexts, and starting the httpd service.

1. Log in as root on Elrond and check if the httpd package is installed:
   rpm –qa | grep httpd
   Note: it's also useful to have the httpd manual pages. To install use:
   yum install httpd httpd-manual
2. Edit */etc/httpd/conf/httpd.conf* and:
   - Uncomment and modify the **ServerName** directive with your server's full domain name (p xx-elrond.rivendell). Be sure to append the port number :80 to the name.
   - Search for the **UserDir** option. By default, this option is disabled, thereby not allowing users on the system to have websites within their home directories. To allow this feature, comment out the following line:
     UserDir disable to **#UserDir disable**
     and uncomment the line below it:
     #UserDir public_html to **UserDir public_html**
     public_html is the directory name that serves as the DocumentRoot for each user's web site.
3. Create four new user accounts: legolas, elrond, celebrian, and arwen:
   useradd *username*
   passwd *username*
   Make sure the permissions on the home directories are set to 751
   chmod 751 /home/*username*
4. Make sure that each user's home directory has a subdirectory called *public_html* with the same permissions as the home directory.
5. Populate each of the four *public_html* directories with a unique *index.html* web page. Feel free to use and modify the sample *index.html* file and **.jpg* images in the */home/cis192/depot* directory on Opus.
6. Verify and modify if necessary permissions as follows:
   - home and *public_html* directories are set to 751
   - *index.html* and **.jpg* files are set to 644
7. Open TCP port 80 in your firewall (refer to Lesson 14 if needed).
8. Check that SELinux is set to enforcing with **getenforce** and home directories are enabled with **setsebool -P httpd_enable_homedirs=1**
9. Modify the SElinux context for all *public_html* directories with
   chcon -vR -t httpd_user_content_t /home/*/public_html
10. Permanently start the httpd services:
    service httpd start
    chkconfig httpd on
11. On Frodo, start a web browser in a graphical session. Visit the default Apache home page by entering the following line in the browser's address text box:

http://172.20.192.*xxx***

12. On Frodo, browse each of the user's home pages with:
    http://p*xx***-elrond/***~username***
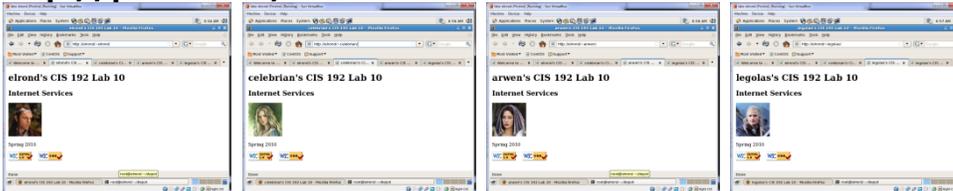
Apache includes the *mod_userdir* module by default, so user's home directories are supported for having web publishing capabilities.

Part II - IP Address Based Virtual Domains

In this procedure we will create virtual domains using multiple IP addresses to distinguish each website. We will need to configure DNS and add additional A records to the zone file. These websites will be kept the /www directory rather than in user's home directories.

1. Install the DNS service packages on Elrond with:
   yum install bind bind-utils
2. Log in as root and change directory to */var/named*.
3. Verify that the DNS packages are installed:
   rpm –qa | grep bind bind-utils
4. Create the two zone database files, *db.rivendell* and *db.***pod***.168.192* in your */var/named* directory. You may leverage the examples in the Appendix for these two files.
5. Change directory to */etc* and create the *named.conf* file for these two zones. See the Appendix for a sample file.
6. Create the key for use by rndc:
   rndc-confgen -a -r /dev/urandom
   chgrp named /etc/rndc.key
   chmod 640 /etc/rndc.key
7. Now edit the *resolv.conf* file to reflect the fact that your server is the DNS server for this domain:
   search rivendell
   nameserver 127.0.0.1
8. Also check the **hosts** line in the */etc/nsswitch.conf* file to make sure that **dns** is in front of the **files** keyword. This will insure we're getting resolution from DNS and not the */etc/hosts* file.
9. Open port 53 on your server.
10. Now you are ready to permanently start the DNS service:
    service named start
    chkconfig named on
11. Do not proceed until the named server starts successfully.
12. Test your DNS service with the host command:
    host p*xx***-elrond**
    host sauron

host 192.168.pod.1
host 192.168.pod.105

13. The next step is to configure the HTTP server. Do this by editing Section 3 of the *httpd.conf* file, which is for virtual hosting.
14. Add a VirtualHost directive to the end of Section 3 just below the commented out example of a virtual host (at the end of the file):
    <VirtualHost 192.168.pod.99>
    ** ServerName remus-farm.rivendell**
    ** DocumentRoot /www/remus-farm**
    </VirtualHost>

    <VirtualHost 192.168.pod.100>
    ** ServerName holy-grail.rivendell**
    ** DocumentRoot /www/holy-grail**
    </VirtualHost>
    Notice that both DocumentRoots don't exist yet!
15. Create the Document Root directories:
    mkdir -p /www/remus-farm /www/holy-grail
    chmod -R 751 /www
16. Now populate these directories with unique index.html files. You can download a template as well as additional image files from the */home/cis192/depot* file on Opus.
17. Our final preparatory step is to add the virtual domain names to our forward lookup zone file:
    vim /var/named/db.rivendell
    Add the following two A records at the bottom of the address section:
    remus-farm   IN A 192.168.pod.99
    holy-grail   IN A 192.168.pod.100
    Save your changes and exit vi.
18. We are now ready to try this out. Reload and restart the *named* and *httpd* services:
    rndc reload
    service httpd restart
    Note: use **chcon -R -v -t httpd_sys_content_t /www** so SELinux won't block Apache serving from a DocumentRoot other than /var/www/html/.
19. If you want to test this from a different machine on the network, you'll have to point that client's resolver to your machine by editing the */etc/resolv.conf* file appropriately.
20. From Sauron, visit your virtual domains:

http://remus-farm   **http://holy-grail.rivendell**

21. Also try:

http://192.168.pod.99   **http://pxx-elrond**   **http://pxx-elrond/~arwen**

22. What happens when you try to access a virtual host that doesn't exist? e.g.
**http://arwen.rivendell**
How about: **http://www.elrond**

Part III - Named Based Virtual Domains

We will now configure our web server to use name-based virtual domain hosting. The different websites are distinguished by the name of the server used in the URL. CNAME records are added to the zone file so the server can have additional names (aliases).

1. Remove the IP aliases we made earlier:
ifconfig eth1:1 down
ifconfig eth1:2 down
2. Edit the *httpd.conf* file:
   - o Uncomment the line: #NameVirtualHost and replace it with:
     NameVirtualHost *your-machine-ip-address*
   - o Replace each of the two *aliased* IP addresses in the <VirtualHost> directives with the IP address of your web server, 192.168.pod.1.
3. Change directory to */var/named* and remove the two address records you added in the last procedure. At the bottom of the zone file, add the following two CNAME records:
remus-farm   **IN CNAME** *your-servername*
holy-grail   **IN CNAME** *your-servername*
4. That is all there is to it. Reload and restart the *named* and *httpd* services:
rndc reload
service httpd restart
and browse to **http://remus-farm.rivendell** and **http://holy-grail.rivendell**
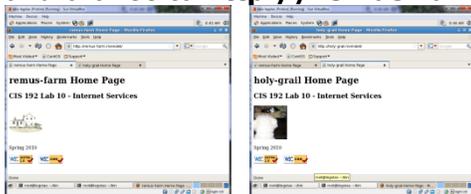
5. Additional directives can be specified in these VirtualHosts sections. They will override the global settings in Sections 1 and 2. For instance, try logging transactions and errors separately for each virtual domain:
TransferLog /www/*domain*/transfer_log
ErrorLog /www/*domain*/error_log
6. Test your web sites as you did in Part II. Do you notice any different behavior? What is the default behavior when you make a request for a virtual domain that resolves to an IP address, but isn't supported as a virtual host?

The answer to this question is important for you to discover :-) Compare:
http://remus-farm with **http://holy-grail** and **http://holy-grail.rivendell**

These are the three most popular ways of hosting multiple websites on a single server. The first technique is what is being used by the Cabrillo web server for the faculty and staff websites. The second method is used by companies that want to support browsers still using HTTP 1.0 protocol, for they cannot handle name-based virtual domains. The third method is the preferred method for modern web-hosting.

To turn in

Your *lab10* **text** file should contain the following:

- */var/named/db.rivendell* file
- */etc/sysconfig/iptables* file
- **ls -lZR /www /home** output
- **getsebool -a | grep httpd**
- **tail -n 20 /www/*/*log** output (all four logs)
- **sed -e '/^#/d' /etc/httpd/conf/httpd.conf** output

Check your work for completeness then submit as many times as you wish up until the due date deadline. Remember, **late work is not accepted**, so start early, plan ahead for things to go wrong and use the forum to ask questions.

      cp lab10 ~rsimms/turnin/cis192/lab10.$LOGNAME

Grading rubric (30 points)

   5 points for a map/crib sheet
   5 points for correct db.rivendell zone file
   3 points for correct firewall settings (open for DNS, HTTP)
   1 points for correct firewall settings (open for forwarding)
   1 points for correct NAT settings (masquerade)
   2 points for correct SELinux context settings
   2 points for correct SELinux booleans
   4 points for non-empty transfer and error logs (four logs total)
   5 points for correct httpd.conf file

Appendix – Web Server Troubleshooting

- **403 Forbidden**
  - o Insure 751 permissions on home and public_html directories
  - o Insure 644 permissions on index.html and *jpg files
  - o SELinux changes
    - ▪ To show SELinux context use **ls –lZR** on files and directories
    - ▪ httpd_enable_homedirs must be on (**setsebool –P httpd_enable_homedirs=1**)
    - ▪ To change context on published files and directory use:
      chcon -R -v -t httpd_user_content_t /home/*/public_html
      or **chcon -R –v -t httpd_sys_content_t /www**

- **Failed to connect**
  - o Open HTTP port in firewall with:
    iptables -I INPUT 4 -m state --state NEW -m tcp -p tcp --dport 80 -j ACCEPT
    (all on one line)
  - o To make the firewall changes permanent use:
    iptables-save > /etc/sysconfig/iptables

- **Address not found**
  - o Might be a typo in the URL or /etc/hosts
  - o The firewall on Elrond may not be opened to allow DNS requests. Open with:
    iptables -I INPUT 4 -m state --state NEW -m udp -p udp --dport 53 -j ACCEPT

Appendix – Elrond Reference Implementation

Interfaces

```
[root@p35-elrond ~]# head /etc/sysconfig/network-scripts/ifcfg-eth*
==> /etc/sysconfig/network-scripts/ifcfg-eth0 <==
NM_CONTROLLED="no"
TYPE="Ethernet"
DEVICE=eth0
ONBOOT=yes
BOOTPROTO=static
IPADDR=172.20.192.245
NETMASK=255.255.0.0

==> /etc/sysconfig/network-scripts/ifcfg-eth1 <==
NM_CONTROLLED="no"
TYPE="Ethernet"
DEVICE=eth1
ONBOOT=yes
BOOTPROTO=static
IPADDR=192.168.35.1
NETMASK=255.255.255.0

==> /etc/sysconfig/network-scripts/ifcfg-eth1:1 <==
DEVICE=eth1:1
ONBOOT=yes
BOOTPROTO=static
IPADDR=192.168.35.99
NETMASK=255.255.255.0
```

```
==> /etc/sysconfig/network-scripts/ifcfg-eth1:2 <==
DEVICE=eth1:2
ONBOOT=yes
BOOTPROTO=static
IPADDR=192.168.35.100
NETMASK=255.255.255.0

==> /etc/sysconfig/network-scripts/ifcfg-eth2 <==
DEVICE="eth2"
BOOTPROTO="dhcp"
NM_CONTROLLED="no"
ONBOOT="no"
TYPE="Ethernet"
[root@p35-elrond ~]#
```

Gateway and hostname

```
[root@p35-elrond ~]# cat /etc/sysconfig/network
NETWORKING=yes
GATEWAY=172.20.0.1
HOSTNAME=p35-elrond.rivendell
[root@p35-elrond ~]#
```

Name resolution

```
[root@p35-elrond ~]# cat /etc/resolv.conf
search rivendell
nameserver 127.0.0.1


[root@p35-elrond ~]# cat /etc/hosts
::1          localhost localhost.localdomain localhost6 localhost6.localdomain6
127.0.0.1 p35-elrond.rivendell p35-elrond localhost.rivendell localhost


[root@p35-elrond ~]# grep hosts /etc/nsswitch.conf
#hosts:     db files nisplus nis dns
hosts:      dns files
```

Firewall and NAT

```
[root@p35-elrond ~]# cat /etc/sysconfig/iptables
# Generated by iptables-save v1.4.7 on Sat May 18 21:17:43 2013
*nat
:PREROUTING ACCEPT [0:0]
:POSTROUTING ACCEPT [0:0]
:OUTPUT ACCEPT [0:0]
-A POSTROUTING -o eth0 -j MASQUERADE
COMMIT
# Completed on Sat May 18 21:17:43 2013
# Generated by iptables-save v1.4.7 on Sat May 18 21:17:43 2013
*filter
:INPUT ACCEPT [0:0]
:FORWARD ACCEPT [0:0]
:OUTPUT ACCEPT [0:0]
-A INPUT -m state --state RELATED,ESTABLISHED -j ACCEPT
-A INPUT -p icmp -j ACCEPT
-A INPUT -i lo -j ACCEPT
-A INPUT -p udp -m udp --dport 53 -j ACCEPT
-A INPUT -p tcp -m state --state NEW -m tcp --dport 53 -j ACCEPT
```

```
-A INPUT -p tcp -m state --state NEW -m tcp --dport 80 -j ACCEPT
-A INPUT -p tcp -m state --state NEW -m tcp --dport 22 -j ACCEPT
-A INPUT -j REJECT --reject-with icmp-host-prohibited
COMMIT
# Completed on Sat May 18 21:17:43 2013
```

DNS Server Configuration

```
[root@p35-elrond ~]# cat /etc/named.conf
options {
        directory "/var/named";
        /*
        * If there is a firewall between you and nameservers you want
        * to talk to, you might need to uncomment the query-source
        * directive below. Previous versions of BIND always asked
        * questions using port 53, but BIND 8.1 uses an unprivileged
        * port by default.
        */
        query-source address * port 53;
};

//
// a caching only nameserver config
//
controls {
        inet 127.0.0.1 allow { localhost; } keys { rndc-key; };
};

zone "." IN {
        type hint;
        file "named.ca";
};

include "/etc/named.rfc1912.zones";

zone "rivendell" IN {
        type master;
        file "db.rivendell";
        allow-update { none; };
};

zone "35.168.192.in-addr.arpa" IN {
        type master;
        file "db.35.168.192";
        allow-update { none; };
};

// A key file needs to be referenced for use by rndc
include "/etc/rndc.key";
```

Rivendell forward lookup zone

```
[root@p35-elrond ~]# cat /var/named/db.rivendell
$TTL 604800
; Rivendell Zone Definition
;
;
Rivendell.      IN SOA p35-elrond.rivendell. root.rivendell. (
                2013051800      ; serial number
                8H              ; refresh rate
                2H              ; retry
                1W              ; expire
```

```
                    1D)                 ; minimum
;
;Name Server Records
Rivendell.      IN NS p35-elrond.rivendell.


;
;Address Records
localhost       IN A 127.0.0.1
p35-elrond      IN A 192.168.35.1
sauron          IN A 192.168.35.105

remus-farm IN CNAME p35-elrond
holy-grail IN CNAME p35-elrond
[root@p35-elrond ~]#
```

Rivendell reverse lookup zone

```
[root@p35-elrond ~]# cat /var/named/db.35.168.192
$TTL    86400
;192.168.35.* Reverse Zone Definition
;
35.168.192.in-addr.arpa. IN SOA  p35-elrond.rivendell. root.rivendell.  (
                        2013051800      ; serial number
                        8H              ; refresh rate
                        2H              ; retry
                        1W              ; expire
                        1D)             ; minimum

;
;Name Server Records
;
35.168.192.in-addr.arpa. IN NS p35-elrond.rivendell.
;
;Address Records
1                       IN PTR  p35-elrond.rivendell.
105                     IN PTR  sauron.rivendell.

99 IN PTR remus-farm.rivendell.
100 IN PTR holy-grail.rivendell.
[root@p35-elrond ~]#
```

Apache Configuration

```
[root@p35-elrond ~]# cat /etc/httpd/conf/httpd.conf
#
# This is the main Apache server configuration file.  It contains the
# configuration directives that give the server its instructions.
# See <URL:http://httpd.apache.org/docs/2.2/> for detailed information.
# In particular, see
# <URL:http://httpd.apache.org/docs/2.2/mod/directives.html>
# for a discussion of each configuration directive.
#
#
# Do NOT simply read the instructions in here without understanding
# what they do.  They're here only as hints or reminders.  If you are unsure
# consult the online docs. You have been warned.
#
# The configuration directives are grouped into three basic sections:
#  1. Directives that control the operation of the Apache server process as a
#     whole (the 'global environment').
#  2. Directives that define the parameters of the 'main' or 'default' server,
#     which responds to requests that aren't handled by a virtual host.
#     These directives also provide default values for the settings
```

```
#     of all virtual hosts.
#  3. Settings for virtual hosts, which allow Web requests to be sent to
#     different IP addresses or hostnames and have them handled by the
#     same Apache server process.
#
# Configuration and logfile names: If the filenames you specify for many
# of the server's control files begin with "/" (or "drive:/" for Win32), the
# server will use that explicit path.  If the filenames do *not* begin
# with "/", the value of ServerRoot is prepended -- so "logs/foo.log"
# with ServerRoot set to "/etc/httpd" will be interpreted by the
# server as "/etc/httpd/logs/foo.log".
#

### Section 1: Global Environment
#
# The directives in this section affect the overall operation of Apache,
# such as the number of concurrent requests it can handle or where it
# can find its configuration files.
#

#
# Don't give away too much information about all the subcomponents
# we are running.  Comment out this line if you don't mind remote sites
# finding out what major optional modules you are running
ServerTokens OS

#
# ServerRoot: The top of the directory tree under which the server's
# configuration, error, and log files are kept.
#
# NOTE!  If you intend to place this on an NFS (or otherwise network)
# mounted filesystem then please read the LockFile documentation
# (available at <URL:http://httpd.apache.org/docs/2.2/mod/mpm_common.html#lockfile>);
# you will save yourself a lot of trouble.
#
# Do NOT add a slash at the end of the directory path.
#
ServerRoot "/etc/httpd"

#
# PidFile: The file in which the server should record its process
# identification number when it starts.  Note the PIDFILE variable in
# /etc/sysconfig/httpd must be set appropriately if this location is
# changed.
#
PidFile run/httpd.pid

#
# Timeout: The number of seconds before receives and sends time out.
#
Timeout 60

#
# KeepAlive: Whether or not to allow persistent connections (more than
# one request per connection). Set to "Off" to deactivate.
#
KeepAlive Off

#
# MaxKeepAliveRequests: The maximum number of requests to allow
# during a persistent connection. Set to 0 to allow an unlimited amount.
# We recommend you leave this number high, for maximum performance.
#
```

```
MaxKeepAliveRequests 100

#
# KeepAliveTimeout: Number of seconds to wait for the next request from the
# same client on the same connection.
#
KeepAliveTimeout 15

##
## Server-Pool Size Regulation (MPM specific)
##

# prefork MPM
# StartServers: number of server processes to start
# MinSpareServers: minimum number of server processes which are kept spare
# MaxSpareServers: maximum number of server processes which are kept spare
# ServerLimit: maximum value for MaxClients for the lifetime of the server
# MaxClients: maximum number of server processes allowed to start
# MaxRequestsPerChild: maximum number of requests a server process serves
<IfModule prefork.c>
StartServers        8
MinSpareServers     5
MaxSpareServers    20
ServerLimit       256
MaxClients        256
MaxRequestsPerChild  4000
</IfModule>

# worker MPM
# StartServers: initial number of server processes to start
# MaxClients: maximum number of simultaneous client connections
# MinSpareThreads: minimum number of worker threads which are kept spare
# MaxSpareThreads: maximum number of worker threads which are kept spare
# ThreadsPerChild: constant number of worker threads in each server process
# MaxRequestsPerChild: maximum number of requests a server process serves
<IfModule worker.c>
StartServers         4
MaxClients         300
MinSpareThreads     25
MaxSpareThreads     75
ThreadsPerChild     25
MaxRequestsPerChild  0
</IfModule>

#
# Listen: Allows you to bind Apache to specific IP addresses and/or
# ports, in addition to the default. See also the <VirtualHost>
# directive.
#
# Change this to Listen on specific IP addresses as shown below to
# prevent Apache from glomming onto all bound IP addresses (0.0.0.0)
#
#Listen 12.34.56.78:80
Listen 80

#
# Dynamic Shared Object (DSO) Support
#
# To be able to use the functionality of a module which was built as a DSO you
# have to place corresponding `LoadModule' lines at this location so the
# directives contained in it are actually available _before_ they are used.
# Statically compiled modules (those listed by `httpd -l') do not need
# to be loaded here.
```

```
#
# Example:
# LoadModule foo_module modules/mod_foo.so
#
LoadModule auth_basic_module modules/mod_auth_basic.so
LoadModule auth_digest_module modules/mod_auth_digest.so
LoadModule authn_file_module modules/mod_authn_file.so
LoadModule authn_alias_module modules/mod_authn_alias.so
LoadModule authn_anon_module modules/mod_authn_anon.so
LoadModule authn_dbm_module modules/mod_authn_dbm.so
LoadModule authn_default_module modules/mod_authn_default.so
LoadModule authz_host_module modules/mod_authz_host.so
LoadModule authz_user_module modules/mod_authz_user.so
LoadModule authz_owner_module modules/mod_authz_owner.so
LoadModule authz_groupfile_module modules/mod_authz_groupfile.so
LoadModule authz_dbm_module modules/mod_authz_dbm.so
LoadModule authz_default_module modules/mod_authz_default.so
LoadModule ldap_module modules/mod_ldap.so
LoadModule authnz_ldap_module modules/mod_authnz_ldap.so
LoadModule include_module modules/mod_include.so
LoadModule log_config_module modules/mod_log_config.so
LoadModule logio_module modules/mod_logio.so
LoadModule env_module modules/mod_env.so
LoadModule ext_filter_module modules/mod_ext_filter.so
LoadModule mime_magic_module modules/mod_mime_magic.so
LoadModule expires_module modules/mod_expires.so
LoadModule deflate_module modules/mod_deflate.so
LoadModule headers_module modules/mod_headers.so
LoadModule usertrack_module modules/mod_usertrack.so
LoadModule setenvif_module modules/mod_setenvif.so
LoadModule mime_module modules/mod_mime.so
LoadModule dav_module modules/mod_dav.so
LoadModule status_module modules/mod_status.so
LoadModule autoindex_module modules/mod_autoindex.so
LoadModule info_module modules/mod_info.so
LoadModule dav_fs_module modules/mod_dav_fs.so
LoadModule vhost_alias_module modules/mod_vhost_alias.so
LoadModule negotiation_module modules/mod_negotiation.so
LoadModule dir_module modules/mod_dir.so
LoadModule actions_module modules/mod_actions.so
LoadModule speling_module modules/mod_speling.so
LoadModule userdir_module modules/mod_userdir.so
LoadModule alias_module modules/mod_alias.so
LoadModule substitute_module modules/mod_substitute.so
LoadModule rewrite_module modules/mod_rewrite.so
LoadModule proxy_module modules/mod_proxy.so
LoadModule proxy_balancer_module modules/mod_proxy_balancer.so
LoadModule proxy_ftp_module modules/mod_proxy_ftp.so
LoadModule proxy_http_module modules/mod_proxy_http.so
LoadModule proxy_ajp_module modules/mod_proxy_ajp.so
LoadModule proxy_connect_module modules/mod_proxy_connect.so
LoadModule cache_module modules/mod_cache.so
LoadModule suexec_module modules/mod_suexec.so
LoadModule disk_cache_module modules/mod_disk_cache.so
LoadModule cgi_module modules/mod_cgi.so
LoadModule version_module modules/mod_version.so

#
# The following modules are not loaded by default:
#
#LoadModule asis_module modules/mod_asis.so
#LoadModule authn_dbd_module modules/mod_authn_dbd.so
#LoadModule cern_meta_module modules/mod_cern_meta.so
```

```
#LoadModule cgid_module modules/mod_cgid.so
#LoadModule dbd_module modules/mod_dbd.so
#LoadModule dumpio_module modules/mod_dumpio.so
#LoadModule filter_module modules/mod_filter.so
#LoadModule ident_module modules/mod_ident.so
#LoadModule log_forensic_module modules/mod_log_forensic.so
#LoadModule unique_id_module modules/mod_unique_id.so
#

#
# Load config files from the config directory "/etc/httpd/conf.d".
#
Include conf.d/*.conf

#
# ExtendedStatus controls whether Apache will generate "full" status
# information (ExtendedStatus On) or just basic information (ExtendedStatus
# Off) when the "server-status" handler is called. The default is Off.
#
#ExtendedStatus On

#
# If you wish httpd to run as a different user or group, you must run
# httpd as root initially and it will switch.
#
# User/Group: The name (or #number) of the user/group to run httpd as.
#  . On SCO (ODT 3) use "User nouser" and "Group nogroup".
#  . On HPUX you may not be able to use shared memory as nobody, and the
#    suggested workaround is to create a user www and use that user.
#  NOTE that some kernels refuse to setgid(Group) or semctl(IPC_SET)
#  when the value of (unsigned)Group is above 60000;
#  don't use Group #-1 on these systems!
#
User apache
Group apache

### Section 2: 'Main' server configuration
#
# The directives in this section set up the values used by the 'main'
# server, which responds to any requests that aren't handled by a
# <VirtualHost> definition.  These values also provide defaults for
# any <VirtualHost> containers you may define later in the file.
#
# All of these directives may appear inside <VirtualHost> containers,
# in which case these default settings will be overridden for the
# virtual host being defined.
#

#
# ServerAdmin: Your address, where problems with the server should be
# e-mailed.  This address appears on some server-generated pages, such
# as error documents.  e.g. admin@your-domain.com
#
ServerAdmin root@localhost

#
# ServerName gives the name and port that the server uses to identify itself.
# This can often be determined automatically, but we recommend you specify
# it explicitly to prevent problems during startup.
#
# If this is not set to valid DNS name for your host, server-generated
# redirections will not work.  See also the UseCanonicalName directive.
#
```

```
# If your host doesn't have a registered DNS name, enter its IP address here.
# You will have to access it by its address anyway, and this will make
# redirections work in a sensible way.
#
ServerName p35-elrond.rivendell:80


#
# UseCanonicalName: Determines how Apache constructs self-referencing
# URLs and the SERVER_NAME and SERVER_PORT variables.
# When set "Off", Apache will use the Hostname and Port supplied
# by the client.  When set "On", Apache will use the value of the
# ServerName directive.
#
UseCanonicalName Off


#
# DocumentRoot: The directory out of which you will serve your
# documents. By default, all requests are taken from this directory, but
# symbolic links and aliases may be used to point to other locations.
#
DocumentRoot "/var/www/html"


#
# Each directory to which Apache has access can be configured with respect
# to which services and features are allowed and/or disabled in that
# directory (and its subdirectories).
#
# First, we configure the "default" to be a very restrictive set of
# features.
#
<Directory />
    Options FollowSymLinks
    AllowOverride None
</Directory>


#
# Note that from this point forward you must specifically allow
# particular features to be enabled - so if something's not working as
# you might expect, make sure that you have specifically enabled it
# below.
#


#
# This should be changed to whatever you set DocumentRoot to.
#
<Directory "/var/www/html">


#
# Possible values for the Options directive are "None", "All",
# or any combination of:
#   Indexes Includes FollowSymLinks SymLinksifOwnerMatch ExecCGI MultiViews
#
# Note that "MultiViews" must be named *explicitly* --- "Options All"
# doesn't give it to you.
#
# The Options directive is both complicated and important.  Please see
# http://httpd.apache.org/docs/2.2/mod/core.html#options
# for more information.
#
    Options Indexes FollowSymLinks


#
# AllowOverride controls what directives may be placed in .htaccess files.
```

```
# It can be "All", "None", or any combination of the keywords:
#   Options FileInfo AuthConfig Limit
#
    AllowOverride None

#
# Controls who can get stuff from this server.
#
    Order allow,deny
    Allow from all

</Directory>


#
# UserDir: The name of the directory that is appended onto a user's home
# directory if a ~user request is received.
#
# The path to the end user account 'public_html' directory must be
# accessible to the webserver userid.  This usually means that ~userid
# must have permissions of 711, ~userid/public_html must have permissions
# of 755, and documents contained therein must be world-readable.
# Otherwise, the client will only receive a "403 Forbidden" message.
#
# See also: http://httpd.apache.org/docs/misc/FAQ.html#forbidden
#
<IfModule mod_userdir.c>
    #
    # UserDir is disabled by default since it can confirm the presence
    # of a username on the system (depending on home directory
    # permissions).
    #
    #UserDir disabled

    #
    # To enable requests to /~user/ to serve the user's public_html
    # directory, remove the "#UserDir disabled" line above, and uncomment
    # the following line instead:
    #
    UserDir public_html

</IfModule>


#
# Control access to UserDir directories.  The following is an example
# for a site where these directories are restricted to read-only.
#
#<Directory /home/*/public_html>
#    AllowOverride FileInfo AuthConfig Limit
#    Options MultiViews Indexes SymLinksIfOwnerMatch IncludesNoExec
#    <Limit GET POST OPTIONS>
#        Order allow,deny
#        Allow from all
#    </Limit>
#    <LimitExcept GET POST OPTIONS>
#        Order deny,allow
#        Deny from all
#    </LimitExcept>
#</Directory>


#
# DirectoryIndex: sets the file that Apache will serve if a directory
# is requested.
#
```

```
# The index.html.var file (a type-map) is used to deliver content-
# negotiated documents.  The MultiViews Option can be used for the
# same purpose, but it is much slower.
#
DirectoryIndex index.html index.html.var

#
# AccessFileName: The name of the file to look for in each directory
# for additional configuration directives.  See also the AllowOverride
# directive.
#
AccessFileName .htaccess

#
# The following lines prevent .htaccess and .htpasswd files from being
# viewed by Web clients.
#
<Files ~ "^\.ht">
    Order allow,deny
    Deny from all
    Satisfy All
</Files>

#
# TypesConfig describes where the mime.types file (or equivalent) is
# to be found.
#
TypesConfig /etc/mime.types

#
# DefaultType is the default MIME type the server will use for a document
# if it cannot otherwise determine one, such as from filename extensions.
# If your server contains mostly text or HTML documents, "text/plain" is
# a good value.  If most of your content is binary, such as applications
# or images, you may want to use "application/octet-stream" instead to
# keep browsers from trying to display binary files as though they are
# text.
#
DefaultType text/plain

#
# The mod_mime_magic module allows the server to use various hints from the
# contents of the file itself to determine its type.  The MIMEMagicFile
# directive tells the module where the hint definitions are located.
#
<IfModule mod_mime_magic.c>
#   MIMEMagicFile /usr/share/magic.mime
    MIMEMagicFile conf/magic
</IfModule>

#
# HostnameLookups: Log the names of clients or just their IP addresses
# e.g., www.apache.org (on) or 204.62.129.132 (off).
# The default is off because it'd be overall better for the net if people
# had to knowingly turn this feature on, since enabling it means that
# each client request will result in AT LEAST one lookup request to the
# nameserver.
#
HostnameLookups Off

#
# EnableMMAP: Control whether memory-mapping is used to deliver
# files (assuming that the underlying OS supports it).
```

```
# The default is on; turn this off if you serve from NFS-mounted
# filesystems.  On some systems, turning it off (regardless of
# filesystem) can improve performance; for details, please see
# http://httpd.apache.org/docs/2.2/mod/core.html#enablemmap
#
#EnableMMAP off


#
# EnableSendfile: Control whether the sendfile kernel support is
# used to deliver files (assuming that the OS supports it).
# The default is on; turn this off if you serve from NFS-mounted
# filesystems.  Please see
# http://httpd.apache.org/docs/2.2/mod/core.html#enablesendfile
#
#EnableSendfile off


#
# ErrorLog: The location of the error log file.
# If you do not specify an ErrorLog directive within a <VirtualHost>
# container, error messages relating to that virtual host will be
# logged here.  If you *do* define an error logfile for a <VirtualHost>
# container, that host's errors will be logged there and not here.
#
ErrorLog logs/error_log


#
# LogLevel: Control the number of messages logged to the error_log.
# Possible values include: debug, info, notice, warn, error, crit,
# alert, emerg.
#
LogLevel warn


#
# The following directives define some format nicknames for use with
# a CustomLog directive (see below).
#
LogFormat "%h %l %u %t \"%r\" %>s %b \"%{Referer}i\" \"%{User-Agent}i\"" combined
LogFormat "%h %l %u %t \"%r\" %>s %b" common
LogFormat "%{Referer}i -> %U" referer
LogFormat "%{User-agent}i" agent

# "combinedio" includes actual counts of actual bytes received (%I) and sent (%O);
this
# requires the mod_logio module to be loaded.
#LogFormat "%h %l %u %t \"%r\" %>s %b \"%{Referer}i\" \"%{User-Agent}i\" %I %O"
combinedio


#
# The location and format of the access logfile (Common Logfile Format).
# If you do not define any access logfiles within a <VirtualHost>
# container, they will be logged here.  Contrariwise, if you *do*
# define per-<VirtualHost> access logfiles, transactions will be
# logged therein and *not* in this file.
#
#CustomLog logs/access_log common


#
# If you would like to have separate agent and referer logfiles, uncomment
# the following directives.
#
#CustomLog logs/referer_log referer
#CustomLog logs/agent_log agent
```

```
#
# For a single logfile with access, agent, and referer information
# (Combined Logfile Format), use the following directive:
#
CustomLog logs/access_log combined


#
# Optionally add a line containing the server version and virtual host
# name to server-generated pages (internal error documents, FTP directory
# listings, mod_status and mod_info output etc., but not CGI generated
# documents or custom error documents).
# Set to "EMail" to also include a mailto: link to the ServerAdmin.
# Set to one of:  On | Off | EMail
#
ServerSignature On


#
# Aliases: Add here as many aliases as you need (with no limit). The format is
# Alias fakename realname
#
# Note that if you include a trailing / on fakename then the server will
# require it to be present in the URL.  So "/icons" isn't aliased in this
# example, only "/icons/".  If the fakename is slash-terminated, then the
# realname must also be slash terminated, and if the fakename omits the
# trailing slash, the realname must also omit it.
#
# We include the /icons/ alias for FancyIndexed directory listings.  If you
# do not use FancyIndexing, you may comment this out.
#
Alias /icons/ "/var/www/icons/"

<Directory "/var/www/icons">
    Options Indexes MultiViews FollowSymLinks
    AllowOverride None
    Order allow,deny
    Allow from all
</Directory>


#
# WebDAV module configuration section.
#
<IfModule mod_dav_fs.c>
    # Location of the WebDAV lock database.
    DAVLockDB /var/lib/dav/lockdb
</IfModule>


#
# ScriptAlias: This controls which directories contain server scripts.
# ScriptAliases are essentially the same as Aliases, except that
# documents in the realname directory are treated as applications and
# run by the server when requested rather than as documents sent to the client.
# The same rules about trailing "/" apply to ScriptAlias directives as to
# Alias.
#
ScriptAlias /cgi-bin/ "/var/www/cgi-bin/"


#
# "/var/www/cgi-bin" should be changed to whatever your ScriptAliased
# CGI directory exists, if you have that configured.
#
<Directory "/var/www/cgi-bin">
    AllowOverride None
    Options None
```

```
        Order allow,deny
        Allow from all
</Directory>

#
# Redirect allows you to tell clients about documents which used to exist in
# your server's namespace, but do not anymore. This allows you to tell the
# clients where to look for the relocated document.
# Example:
# Redirect permanent /foo http://www.example.com/bar

#
# Directives controlling the display of server-generated directory listings.
#

#
# IndexOptions: Controls the appearance of server-generated directory
# listings.
#
IndexOptions FancyIndexing VersionSort NameWidth=* HTMLTable Charset=UTF-8

#
# AddIcon* directives tell the server which icon to show for different
# files or filename extensions.  These are only displayed for
# FancyIndexed directories.
#
AddIconByEncoding (CMP,/icons/compressed.gif) x-compress x-gzip

AddIconByType (TXT,/icons/text.gif) text/*
AddIconByType (IMG,/icons/image2.gif) image/*
AddIconByType (SND,/icons/sound2.gif) audio/*
AddIconByType (VID,/icons/movie.gif) video/*

AddIcon /icons/binary.gif .bin .exe
AddIcon /icons/binhex.gif .hqx
AddIcon /icons/tar.gif .tar
AddIcon /icons/world2.gif .wrl .wrl.gz .vrml .vrm .iv
AddIcon /icons/compressed.gif .Z .z .tgz .gz .zip
AddIcon /icons/a.gif .ps .ai .eps
AddIcon /icons/layout.gif .html .shtml .htm .pdf
AddIcon /icons/text.gif .txt
AddIcon /icons/c.gif .c
AddIcon /icons/p.gif .pl .py
AddIcon /icons/f.gif .for
AddIcon /icons/dvi.gif .dvi
AddIcon /icons/uuencoded.gif .uu
AddIcon /icons/script.gif .conf .sh .shar .csh .ksh .tcl
AddIcon /icons/tex.gif .tex
AddIcon /icons/bomb.gif core

AddIcon /icons/back.gif ..
AddIcon /icons/hand.right.gif README
AddIcon /icons/folder.gif ^^DIRECTORY^^
AddIcon /icons/blank.gif ^^BLANKICON^^

#
# DefaultIcon is which icon to show for files which do not have an icon
# explicitly set.
#
DefaultIcon /icons/unknown.gif

#
# AddDescription allows you to place a short description after a file in
```

```
# server-generated indexes.  These are only displayed for FancyIndexed
# directories.
# Format: AddDescription "description" filename
#
#AddDescription "GZIP compressed document" .gz
#AddDescription "tar archive" .tar
#AddDescription "GZIP compressed tar archive" .tgz


#
# ReadmeName is the name of the README file the server will look for by
# default, and append to directory listings.
#
# HeaderName is the name of a file which should be prepended to
# directory indexes.
ReadmeName README.html
HeaderName HEADER.html


#
# IndexIgnore is a set of filenames which directory indexing should ignore
# and not include in the listing.  Shell-style wildcarding is permitted.
#
IndexIgnore .??* *~ *# HEADER* README* RCS CVS *,v *,t


#
# DefaultLanguage and AddLanguage allows you to specify the language of
# a document. You can then use content negotiation to give a browser a
# file in a language the user can understand.
#
# Specify a default language. This means that all data
# going out without a specific language tag (see below) will
# be marked with this one. You probably do NOT want to set
# this unless you are sure it is correct for all cases.
#
# * It is generally better to not mark a page as
# * being a certain language than marking it with the wrong
# * language!
#
# DefaultLanguage nl
#
# Note 1: The suffix does not have to be the same as the language
# keyword --- those with documents in Polish (whose net-standard
# language code is pl) may wish to use "AddLanguage pl .po" to
# avoid the ambiguity with the common suffix for perl scripts.
#
# Note 2: The example entries below illustrate that in some cases
# the two character 'Language' abbreviation is not identical to
# the two character 'Country' code for its country,
# E.g. 'Danmark/dk' versus 'Danish/da'.
#
# Note 3: In the case of 'ltz' we violate the RFC by using a three char
# specifier. There is 'work in progress' to fix this and get
# the reference data for rfc1766 cleaned up.
#
# Catalan (ca) - Croatian (hr) - Czech (cs) - Danish (da) - Dutch (nl)
# English (en) - Esperanto (eo) - Estonian (et) - French (fr) - German (de)
# Greek-Modern (el) - Hebrew (he) - Italian (it) - Japanese (ja)
# Korean (ko) - Luxembourgeois* (ltz) - Norwegian Nynorsk (nn)
# Norwegian (no) - Polish (pl) - Portugese (pt)
# Brazilian Portuguese (pt-BR) - Russian (ru) - Swedish (sv)
# Simplified Chinese (zh-CN) - Spanish (es) - Traditional Chinese (zh-TW)
#
AddLanguage ca .ca
AddLanguage cs .cz .cs
```

```
AddLanguage da .dk
AddLanguage de .de
AddLanguage el .el
AddLanguage en .en
AddLanguage eo .eo
AddLanguage es .es
AddLanguage et .et
AddLanguage fr .fr
AddLanguage he .he
AddLanguage hr .hr
AddLanguage it .it
AddLanguage ja .ja
AddLanguage ko .ko
AddLanguage ltz .ltz
AddLanguage nl .nl
AddLanguage nn .nn
AddLanguage no .no
AddLanguage pl .po
AddLanguage pt .pt
AddLanguage pt-BR .pt-br
AddLanguage ru .ru
AddLanguage sv .sv
AddLanguage zh-CN .zh-cn
AddLanguage zh-TW .zh-tw

#
# LanguagePriority allows you to give precedence to some languages
# in case of a tie during content negotiation.
#
# Just list the languages in decreasing order of preference. We have
# more or less alphabetized them here. You probably want to change this.
#
LanguagePriority en ca cs da de el eo es et fr he hr it ja ko ltz nl nn no pl pt pt-BR
ru sv zh-CN zh-TW

#
# ForceLanguagePriority allows you to serve a result page rather than
# MULTIPLE CHOICES (Prefer) [in case of a tie] or NOT ACCEPTABLE (Fallback)
# [in case no accepted languages matched the available variants]
#
ForceLanguagePriority Prefer Fallback

#
# Specify a default charset for all content served; this enables
# interpretation of all content as UTF-8 by default.  To use the
# default browser choice (ISO-8859-1), or to allow the META tags
# in HTML content to override this choice, comment out this
# directive:
#
AddDefaultCharset UTF-8

#
# AddType allows you to add to or override the MIME configuration
# file mime.types for specific file types.
#
#AddType application/x-tar .tgz

#
# AddEncoding allows you to have certain browsers uncompress
# information on the fly. Note: Not all browsers support this.
# Despite the name similarity, the following Add* directives have nothing
# to do with the FancyIndexing customization directives above.
#
```

```
#AddEncoding x-compress .Z
#AddEncoding x-gzip .gz .tgz

# If the AddEncoding directives above are commented-out, then you
# probably should define those extensions to indicate media types:
#
AddType application/x-compress .Z
AddType application/x-gzip .gz .tgz

#
#   MIME-types for downloading Certificates and CRLs
#
AddType application/x-x509-ca-cert .crt
AddType application/x-pkcs7-crl    .crl

#
# AddHandler allows you to map certain file extensions to "handlers":
# actions unrelated to filetype. These can be either built into the server
# or added with the Action directive (see below)
#
# To use CGI scripts outside of ScriptAliased directories:
# (You will also need to add "ExecCGI" to the "Options" directive.)
#
#AddHandler cgi-script .cgi

#
# For files that include their own HTTP headers:
#
#AddHandler send-as-is asis

#
# For type maps (negotiated resources):
# (This is enabled by default to allow the Apache "It Worked" page
#  to be distributed in multiple languages.)
#
AddHandler type-map var

#
# Filters allow you to process content before it is sent to the client.
#
# To parse .shtml files for server-side includes (SSI):
# (You will also need to add "Includes" to the "Options" directive.)
#
AddType text/html .shtml
AddOutputFilter INCLUDES .shtml

#
# Action lets you define media types that will execute a script whenever
# a matching file is called. This eliminates the need for repeated URL
# pathnames for oft-used CGI file processors.
# Format: Action media/type /cgi-script/location
# Format: Action handler-name /cgi-script/location
#

#
# Customizable error responses come in three flavors:
# 1) plain text 2) local redirects 3) external redirects
#
# Some examples:
#ErrorDocument 500 "The server made a boo boo."
#ErrorDocument 404 /missing.html
#ErrorDocument 404 "/cgi-bin/missing_handler.pl"
#ErrorDocument 402 http://www.example.com/subscription_info.html
```

```
#

#
# Putting this all together, we can internationalize error responses.
#
# We use Alias to redirect any /error/HTTP_<error>.html.var response to
# our collection of by-error message multi-language collections.  We use
# includes to substitute the appropriate text.
#
# You can modify the messages' appearance without changing any of the
# default HTTP_<error>.html.var files by adding the line:
#
#    Alias /error/include/ "/your/include/path/"
#
# which allows you to create your own set of files by starting with the
# /var/www/error/include/ files and
# copying them to /your/include/path/, even on a per-VirtualHost basis.
#

Alias /error/ "/var/www/error/"

<IfModule mod_negotiation.c>
<IfModule mod_include.c>
    <Directory "/var/www/error">
        AllowOverride None
        Options IncludesNoExec
        AddOutputFilter Includes html
        AddHandler type-map var
        Order allow,deny
        Allow from all
        LanguagePriority en es de fr
        ForceLanguagePriority Prefer Fallback
    </Directory>

#    ErrorDocument 400 /error/HTTP_BAD_REQUEST.html.var
#    ErrorDocument 401 /error/HTTP_UNAUTHORIZED.html.var
#    ErrorDocument 403 /error/HTTP_FORBIDDEN.html.var
#    ErrorDocument 404 /error/HTTP_NOT_FOUND.html.var
#    ErrorDocument 405 /error/HTTP_METHOD_NOT_ALLOWED.html.var
#    ErrorDocument 408 /error/HTTP_REQUEST_TIME_OUT.html.var
#    ErrorDocument 410 /error/HTTP_GONE.html.var
#    ErrorDocument 411 /error/HTTP_LENGTH_REQUIRED.html.var
#    ErrorDocument 412 /error/HTTP_PRECONDITION_FAILED.html.var
#    ErrorDocument 413 /error/HTTP_REQUEST_ENTITY_TOO_LARGE.html.var
#    ErrorDocument 414 /error/HTTP_REQUEST_URI_TOO_LARGE.html.var
#    ErrorDocument 415 /error/HTTP_UNSUPPORTED_MEDIA_TYPE.html.var
#    ErrorDocument 500 /error/HTTP_INTERNAL_SERVER_ERROR.html.var
#    ErrorDocument 501 /error/HTTP_NOT_IMPLEMENTED.html.var
#    ErrorDocument 502 /error/HTTP_BAD_GATEWAY.html.var
#    ErrorDocument 503 /error/HTTP_SERVICE_UNAVAILABLE.html.var
#    ErrorDocument 506 /error/HTTP_VARIANT_ALSO_VARIES.html.var

</IfModule>
</IfModule>

#
# The following directives modify normal HTTP response behavior to
# handle known problems with browser implementations.
#
BrowserMatch "Mozilla/2" nokeepalive
BrowserMatch "MSIE 4\.0b2;" nokeepalive downgrade-1.0 force-response-1.0
BrowserMatch "RealPlayer 4\.0" force-response-1.0
BrowserMatch "Java/1\.0" force-response-1.0
```

```
BrowserMatch "JDK/1\.0" force-response-1.0


#
# The following directive disables redirects on non-GET requests for
# a directory that does not include the trailing slash.  This fixes a
# problem with Microsoft WebFolders which does not appropriately handle
# redirects for folders with DAV methods.
# Same deal with Apple's DAV filesystem and Gnome VFS support for DAV.
#
BrowserMatch "Microsoft Data Access Internet Publishing Provider" redirect-carefully
BrowserMatch "MS FrontPage" redirect-carefully
BrowserMatch "^WebDrive" redirect-carefully
BrowserMatch "^WebDAVFS/1.[0123]" redirect-carefully
BrowserMatch "^gnome-vfs/1.0" redirect-carefully
BrowserMatch "^XML Spy" redirect-carefully
BrowserMatch "^Dreamweaver-WebDAV-SCM1" redirect-carefully


#
# Allow server status reports generated by mod_status,
# with the URL of http://servername/server-status
# Change the ".example.com" to match your domain to enable.
#
#<Location /server-status>
#    SetHandler server-status
#    Order deny,allow
#    Deny from all
#    Allow from .example.com
#</Location>


#
# Allow remote server configuration reports, with the URL of
#  http://servername/server-info (requires that mod_info.c be loaded).
# Change the ".example.com" to match your domain to enable.
#
#<Location /server-info>
#    SetHandler server-info
#    Order deny,allow
#    Deny from all
#    Allow from .example.com
#</Location>


#
# Proxy Server directives. Uncomment the following lines to
# enable the proxy server:
#
#<IfModule mod_proxy.c>
#ProxyRequests On
#
#<Proxy *>
#    Order deny,allow
#    Deny from all
#    Allow from .example.com
#</Proxy>


#
# Enable/disable the handling of HTTP/1.1 "Via:" headers.
# ("Full" adds the server version; "Block" removes all outgoing Via: headers)
# Set to one of: Off | On | Full | Block
#
#ProxyVia On


#
# To enable a cache of proxied content, uncomment the following lines.
```

```
# See http://httpd.apache.org/docs/2.2/mod/mod_cache.html for more details.
#
#<IfModule mod_disk_cache.c>
#   CacheEnable disk /
#   CacheRoot "/var/cache/mod_proxy"
#</IfModule>
#


#</IfModule>
# End of proxy directives.

### Section 3: Virtual Hosts
#
# VirtualHost: If you want to maintain multiple domains/hostnames on your
# machine you can setup VirtualHost containers for them. Most configurations
# use only name-based virtual hosts so the server doesn't need to worry about
# IP addresses. This is indicated by the asterisks in the directives below.
#
# Please see the documentation at
# <URL:http://httpd.apache.org/docs/2.2/vhosts/>
# for further details before you try to setup virtual hosts.
#
# You may use the command line option '-S' to verify your virtual host
# configuration.


#
# Use name-based virtual hosting.
#
NameVirtualHost 192.168.35.1
#
# NOTE: NameVirtualHost cannot be used without a port specifier
# (e.g. :80) if mod_ssl is being used, due to the nature of the
# SSL protocol.
#


#
# VirtualHost example:
# Almost any Apache directive may go into a VirtualHost container.
# The first VirtualHost section is used for requests without a known
# server name.
#
#<VirtualHost *:80>
#    ServerAdmin webmaster@dummy-host.example.com
#    DocumentRoot /www/docs/dummy-host.example.com
#    ServerName dummy-host.example.com
#    ErrorLog logs/dummy-host.example.com-error_log
#    CustomLog logs/dummy-host.example.com-access_log common
#</VirtualHost>
<VirtualHost 192.168.35.1>
    ServerName remus-farm.rivendell
    DocumentRoot /www/remus-farm
    TransferLog /www/remus-farm/transfer_log
    ErrorLog /www/remus-farm/error_log
</VirtualHost>

<VirtualHost 192.168.35.1>
    ServerName holy-grail.rivendell
    DocumentRoot /www/holy-grail
    TransferLog /www/holy-grail/transfer_log
    ErrorLog /www/holy-grail/error_log
</VirtualHost>

[root@p35-elrond ~]#
```

Appendix – Sauron Reference Implementation

```
root@p35-sauron:~# cat /etc/network/interfaces
auto lo
iface lo inet loopback

auto eth0
iface eth0 inet static

address 192.168.35.105
netmask 255.255.255.0

gateway 192.168.35.1

dns-search rivendell
dns-nameservers 192.168.35.1

root@p35-sauron:~#
```

Appendix – Frodo Reference Implementation

```
root@p35-frodo:~# cat /etc/network/interfaces
auto lo
iface lo inet loopback

root@p35-frodo:~#
```